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CONCRETE AGGREGATES

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STRENGTH AND DURABILITY OF CONCRETE CONTAINING CRUSHED CONCRETE AGGREGATES

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Abstract

Crushed concrete aggregates sourced from waste concrete are a sustainable alternative to natural crushed stone aggregates. This paper presents a study to evaluate the potential of replacing natural crushed stone aggregates in concrete with crushed concrete aggregates (CCA). Mathematical models were developed using regression analysis to account for the effect of aggregate replacement on the strength parameters of concrete. The strength and durability properties of concrete containing CCA were evaluated by a comprehensive experimental investigation involving nine control mixes. The variables considered in the experimental study are water cement ratio, cement content in concrete and percentage replacement of coarse aggregate (CA). The strength properties such as compressive strength, modulus of elasticity, split tensile strength and flexural strength are studied. The results obtained from the present study and data available in published literature were used for the development of the strength prediction models. Durability properties such as water absorption, sorptivity, acid attack resistance and chloride permeability are determined in this study. The test results showed that up to 25% of natural crushed stone aggregates in concrete may be replaced with CCA without significantly affecting the strength of

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